PTO/SB/21 (08-03) Approved for use through 08/30/2003. OMB 0651-0031 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. Application Number 10/710,403 TRANSMITTAL Filing Date 7/8/2004 **FORM** First Named Inventor KUN-RONG CHANG Art I Init (to be used for all correspondence after initial filing) **Examiner Name** Attorney Docket Number OTMP0082USA Total Number of Pages in This Submission **ENCLOSURES** (Check all that apply) After Allowance communication • Fee Transmittal Form Drawing(s) to Technology Center (TC) Appeal Communication to Board Fee Attached Licensing-related Papers of Appeals and Interferences Appeal Communication to TC Amendment/Reply Petition (Appeal Notice, Brief, Reply Brief) Petition to Convert to a Proprietary Information After Final Provisional Application Power of Attorney, Revocation Status Letter Affidavits/declaration(s) Change of Correspondence Address Other Enclosure(s) (please Terminal Disclaimer Extension of Time Request Identify below): Request for Refund **Express Abandonment Request** CD, Number of CD(s) Information Disclosure Statement Remarks Certified Copy of Priority Document(s) Response to Missing Parts/ Incomplete Application Response to Missing Parts under 37 CFR 1.52 or 1.53 SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT Firm Winston Hsu, Reg. No.: 41,526 Individual name Signature Date CERTIFICATE OF TRANSMISSION/MAILING I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below. Typed or printed name

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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FEE	TRAN	SMIT	TAL
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Effective 10/01/2003. Patent fees are subject to annual revision.

Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT

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Filing Date	7/8/2004
First Named Inventor	KUN-RONG CHANG
Examiner Name	
Art Unit	
Attorney Docket No.	OTMP0082USA

METHOD OF PAYMENT (check all that apply)	FEE CALCULATION (continued)					
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Deposit Account:	<u>Large</u> l	Entity	Small	Entity	,	
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Name Name					cover sheet	
The Director is authorized to: (check all that apply)	1053 1812	130	1053		Non-English specification	
Charge fee(s) indicated below Credit any overpayments	1804	920*	1804	•	For filing a request for ex parte reexamination	
Charge any additional fee(s) or any underpayment of fee(s)	1004	920	1004	920	Requesting publication of SIR prior to Examiner action	
Charge fee(s) indicated below, except for the filing fee	1805	1,840*	1805	1,840*	Requesting publication of SIR after	
to the above-identified deposit account.	1251	110	2251	55	Examiner action	
FEE CALCULATION	1252	420	2252	210	Extension for reply within first month Extension for reply within second month	
1. BASIC FILING FEE Large Entity Small Entity	1253	950	2253		Extension for reply within third month	
Fee Fee Fee Fee Description Fee Paid	1254		2254	740	Extension for reply within fourth month	
Code (\$)	1255		2255		Extension for reply within fifth month	
1001 770 2001 385 Utility filing fee	1401	330	2401			
1002 340 2002 170 Design filing fee	1401	330	2401		Notice of Appeal	
1003 530 2003 265 Plant filing fee 1004 770 2004 385 Reissue filing fee	1402	290	2402		Filing a brief in support of an appeal Request for oral hearing	
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1005 160 2005 80 Provisional filing fee		110	2452	,	Petition to institute a public use proceeding Petition to revive - unavoidable	
SUBTOTAL (1) (\$) 0.00	1452 1453		2453			
2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE	1501		2501		Petition to revive - unintentional Utility issue fee (or reissue)	
Fee from <u>Extra Claims below</u> Fee Paid	1502	480	2502		Design issue fee	
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Large Entity Small Entity	1806	180	1806		Submission of Information Disclosure Stmt	
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1202 18 2202 9 Claims in excess of 20	1809	770	2809		property (times number of properties) Filing a submission after final rejection	
1201 86 2201 43 Independent claims in excess of 3	1009	,,,	2008	, 363	(37 CFR 1.129(a))	
1203 290 2203 145 Multiple dependent claim, if not paid	1810	770	2810	385	For each additional invention to be	
1204 86 2204 43 ** Reissue independent claims over original patent	1801	770	2801	385	examined (37 CFR 1.129(b)) Request for Continued Examination (RCE)	
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**or number previously paid, if greater; For Reissues, see above	*Redu	ced by	Basic F	Filing Fe	ee Paid SUBTOTAL (3) (\$) 0.00	

SUBMITTED BY			(Complete (if applicable))
Name (Print/Type)	Winston Hsu	Registration No. (Attorney/Agent) 41,526	Telephone 886289237350
Signature	winds	stay	Date //26/200

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Approved for use through 10/31/2002. OMB 0651-0032

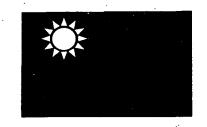
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DECLARATION — Supplemental Priority Data Sheet

Additional foreign app	lications:			
Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES NO
092212921	Taiwan R.O.C	07/14/2003		
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中華民國經濟部智慧財產局。

INTELLECTUAL PROPERTY OFFICE
MINISTRY OF ECONOMIC AFFAIRS
REPUBLIC OF CHINA

茲證明所附文件,係本局存檔中原申請案的副本,正確無訛,其申請資料如下:

This is to certify that annexed is a true copy from the records of this office of the application as originally filed which is identified hereunder:

申 請 日:西元 2003 年 07 月 14 日

Application Date

申 請 案 號: 092212921

Application No.

申 請 人;(中強光電股份有限公司

Applicant(s)

인도 인도 인도 인도 인도 인도 인도

局

長

Director General

蔡練生

發文日期: 西元_2004 年 _3 月_15 E

Issue Date

發文字號: 09320244900

Serial No.



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申請日期	:	IPC分類
申請案號	:	

以上各欄	由本局填	新型專利說明書
_	中文	背投影顯示裝置
、 新型名稱	英文	Rear projection display apparatus
	姓 名 (中文)	1. 張根榮
=	姓 名 (英文)	1. Kun-Rong Chang
創作人 (共1人)	國籍(中英文)	1. 中華民國 TW
	住居所 (中 文)	1. 新竹科學工業園區新竹市力行路11號
	住居所(英文)	1.No. 11. Li Hsin Rd. Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.
	名稱或 姓 名 (中文)	1. 中強光電股份有限公司
-	名稱或 姓 名 (英文)	1. Coretronic Corporation
= [國 籍 (中英文)	1. 中華民國
申請人	住居所 (營業所) (中 文)	1. 新竹科學工業園區新竹市力行路11號 (本地址與前向貴局申請者相同)
	住居所 (營業所) (英 文)	1.No. 11. Li Hsin Rd. Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.
	代表人(中文)	1. 張威儀
	代表人 (英文)	1. Wade Chang



四、中文創作摘要 (創作名稱:背投影顯示裝置)

一種背投影顯示裝置包括一殼體、以及設於殼體內之光學引擎、多重曲率反射鏡、平面鏡數個不同曲率反射鏡表面依光路徑長短數個不同曲率半徑之射面於學引擎提供影像光東內重曲端反射鏡修正影像變形及解於像足現於螢幕上,以最後的平面鏡再次反射彎折而將影像呈現於螢幕上,以達到改善影像變形及薄化裝置厚度。

英文創作摘要 (創作名稱:Rear projection display apparatus)

A rear projection display apparatus comprises a cabinet for storing an optical engine for providing a light beam, multi-curvature mirror, a mirror, and a screen. The multi-curvature mirror, for reflecting the light beam to the mirror, consists of plurality of reflecting surfaces with different curvature radius depending on the optical path from the optical engine to the screen, thus it can compensate the optical path so as to correcte the image distortion. The mirror is disposed parallel with the screen for





四、中文創作摘要 (創作名稱:背投影顯示裝置)

英文創作摘要 (創作名稱: Rear projection display apparatus)

reflecting the light beam to the screen. Thereby, the rear projection display apparatus can be improved the image distortion and reduced the depth of the display apparatus.



四、中文創作摘要 (創作名稱:背投影顯示裝置)

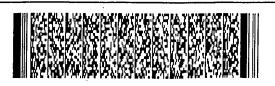
伍、(一)、本案代表圖為:第___3_____圖

(二)、本案代表圖之元件代表符號簡單說明:

顯示裝置30設體31光學引擎32多重曲率反射鏡33

平面鏡 34 螢幕 35

英文創作摘要 (創作名稱: Rear projection display apparatus)



一、本案已向
國家(地區)申請專利

申請日期

案 號

主張專利法第一百零五條準用 第二十四條第一項優先權

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無

`二、□主張專利法第一百零五條準用第二十五條之一第一項優先權:

申請案號:

日期:

無

三、主張本案係符合專利法第九十八條第一項□第一款但書或□第二款但書規定之期間 日期:



五、創作說明 (1)

【新型所屬之技術領域】

本創作係有關背投影顯示裝置,尤其係指一種利用多重曲率反射鏡來薄化裝置厚度之背投影顯示裝置。

【先前技術】

一般背投影顯示裝置係由光學引擎產生一影像光束經反射鏡曲折光路徑後,將影像投射於螢幕上,藉由反射鏡將光路彎向螢幕,以縮小顯示裝置厚度。

請參閱第 1 圖所示,習知背投影顯示裝置 1 () 係 採 用平面鏡來反射光路徑,其中設一大平面鏡 1 1 一小平面鏡 1 3 於光學引擎 1 4 出 端 以使由光學引擎14投射出之影像可經小平面鏡 大平面鏡反射 1 1後投射至螢幕1 2上,然小平面鏡 需向上傾斜一角度設置,使影像可投射大平面鏡 而大平面鏡 1 1 亦需傾斜設置以補償不等長光路 但傾斜設置平面鏡會使得系統厚度增大,致使薄化系統 厚度之效果有限

請參閱第2圖所示,係日本特開平2001-5 4 7 專利所揭示之背投影顯示裝置 2 -0 ,將大平 5 平行螢幕2 6 設置,再利用複數個曲面鏡 (即 第二凹曲面鏡2 2 及第三凸曲面鏡 1) 設 於 光 學 引 擎 2 4 與 大 平 面 鏡 2 5 間 , 以 增 加 光 路 徑 彎折數目使系統厚度得以縮減且畫面得以展開,再藉適 2、23角度位置,以補償光路 調整曲面鏡21、 2 徑不等長造成影像變形,然隨著曲面鏡數目增加,其本





五、創作說明 (2)

身之精密度及相對曲面鏡間之對正精密度需更為緊密配置誤差,以避免引起偏離、影像變形等問題而降低影像品質,但此將造成曲面鏡之製造成本提高,且各曲面鏡間對正調整時間及複雜度增加。

【新型內容】

本創作之一目的,係提供一種背投影顯示裝置,利用於多重曲率反射鏡上設置不同曲率半徑之反射面以補償光路徑不等長,達到修正影像變形。

本創作之另一目的,係提供一種背投影顯示裝置,藉由單一多重曲率反射鏡取代複數個曲面鏡之功能,使減少元件數目並簡化調整對準工作。

本創作之又一目的,係提供一種背投影顯示裝置,藉一多重曲率反射鏡及平行螢幕設置之平面鏡,來彎折光路徑,以達到薄化裝置厚度及增大螢幕面積。

為達上述目的,本創作之背投影顯示裝置包括一般體、以及設於殼體內之光學引擎、多重曲率反射鏡表面依光路經長短設面鏡及螢幕,其中多重曲率反射鏡表面依光路經長短設有複數個不同曲率半徑之反射面,藉由光學引擎提供影像光束,經多重曲率反射鏡修正影像變形後將光路徑反射彎折至平面鏡,最後由平面鏡再次反射彎折而將影像呈現於螢幕上,以達到薄化裝置厚度及改善影像變形。

【實施方式】

有關本創作為達到上述目的,所採用之技術手段及其餘功效,茲舉一較佳實施例,並配合圖式加以說明如





五、創作說明 (3)

下:

參閱 , 係本創作背投影顯示裝 圖所示 包括一 贈 3 1 以 及設於殼體 3 1 內之光學 多 率 反 3 3 面鏡 3 4 及 一 螢 慕 射 3 2 3 2 提供影像光束 1 並投射於 曲率反射 多 3 3 3 上 重 曲 率反射 鏡 係設置於 3 1 光 上並朝向平面鏡 3 路 徑 4 傾 3 2 至 平 3 像 光 束 1 反 射 後 投 射 面 鏡 率 且多 重 3 3 上 示 曲 反 射 鏡 由 複 徑 之反射 面 (如近似凹反 射 3 3 2 近似 面 3 3 3 面 近似 3 3 反 射 凸 反 射 面 4 形 而 曲 成 3 3 係取 決 於 光 壆 31 擎 2 至 螢 幕 5 之 光 路 且 率 半 徑 與光路 徑距離成反比 曲 小 實 本 利 3 表面 分隔成複數個不同 區域 (2 3 3 3 3 而 分 割 區域之大小密 4) 度可依光 幅度 而 訂 再 利用 光路 算 出 徑 推 每一區域之曲 徑 例如 光路 較長者 3 2 徑 (如 : 1 Α 則於) 光 徑通過之 多 率 3 3表面設置曲率 重 曲 反 射 鏡 3 2 影 像光束投射於凹反射 盽 曲 面 向 內 彎 曲 而 將 影像縮 小 使影 縮 小 而 光路 徑較短時 (如 3 2 1 В) 則 率反射 通過之 多 鏡 3 3 重 曲 表面設置曲 率 半 徑 正 之凸反射 3 使影 像光束投射於凸反射 4 面 時,影像會 依曲面向外彎曲而將影像放大,使影像縮放





五、創作說明 (4)

倍率增大;因此,藉由多重曲率反射鏡 3 3 來補償光路徑不等長,使影像放大倍率相同,而修正影像變形問題;而平面鏡 3 4 係平行螢幕 3 5 設置於螢幕 3 5 背面,以將多重曲率反射鏡 3 3 反射之影像光束 3 3 1 反射至螢幕 3 5 上。

藉由光學引擎32提供影像光束321,經多重曲光學引擎34反射。東西鏡34反射,經後置厚度 的 與平面鏡35上,以達到薄化裝置厚度 由 於平面鏡34平行螢幕35擺置,而藉至多重曲段的一种,在 不 等 長 的 與 平面鏡 34之距離縮短不 年 由 的 與 平面鏡 34之距離縮短 中 由 率 半徑的變化可使影像縮放,因此可透過適當曲率半徑置使影像展開,而增大螢幕尺寸。

另由於投射於多重曲率反射鏡 3 3 之影像,利用多重曲率反射鏡 3 3 上不同曲率半徑之反射面將影像反射至平面鏡 3 4 ,而使影像進行適當的縮放至放大倍率相同,以補償光路徑不等長產生之影像變形;請參閱第5圖所示,係根據本創作之背投影顯示裝置,利用光學設計軟體(該軟體為Zemax)進行模擬所得結果,其中該影像光束經多重曲率反射鏡 3 3 補償修正後,使得影像可近似螢幕形狀投射於螢幕 3 5 上,因此,可證實本創作可達到修正影像變形目的。

而本創作利用單一多重曲率反射鏡33透過其表面上曲率半徑的變化來取代習知採用複數個曲面鏡之功效





五、創作說明 (5)

,使得可簡少元件數目,且不需藉由調整曲面鏡間相對位置角度達到修正影像變形,因此,可有效降低調整複雜度及時間,且降低顯示裝置成本及簡化調整對準工作

以上所述,僅用以方便說明本創作之較佳實施例,本創作之範圍不限於該等較佳實施例,凡依本創作所做的任何變更,於不脫離本創作之精神下,皆屬本創作申請專利範圍。



圖式簡單說明

【圖式簡要說明】

- 第1圖係習知背投影顯示裝置之示意圖。
- 第2圖 係習知另一背投影顯示裝置之示意圖。
- 第3圖係本創作背投影顯示裝置之示意圖。
- 第4圖係本創作背投影顯示裝置之多重曲率反射鏡之立體圖。
- 第5圖係本創作背投影顯示裝置之後視圖。

【圖號簡要說明】

- 顯示裝置
- 3 0

殼 體

- 3 1
- 光學引擎
- 3 2
- 影像光束
- 3 2 1 · 3 2 1 A · 3 2 1 B
- 多重曲率反射鏡
- 3 3
- 影像光束
- 3 3 1
- 凹反射面
- 3 3 2
- 平反射面

3 3 3

- 凸反射面
- 3 3 4

平面鏡

3 4

螢 幕

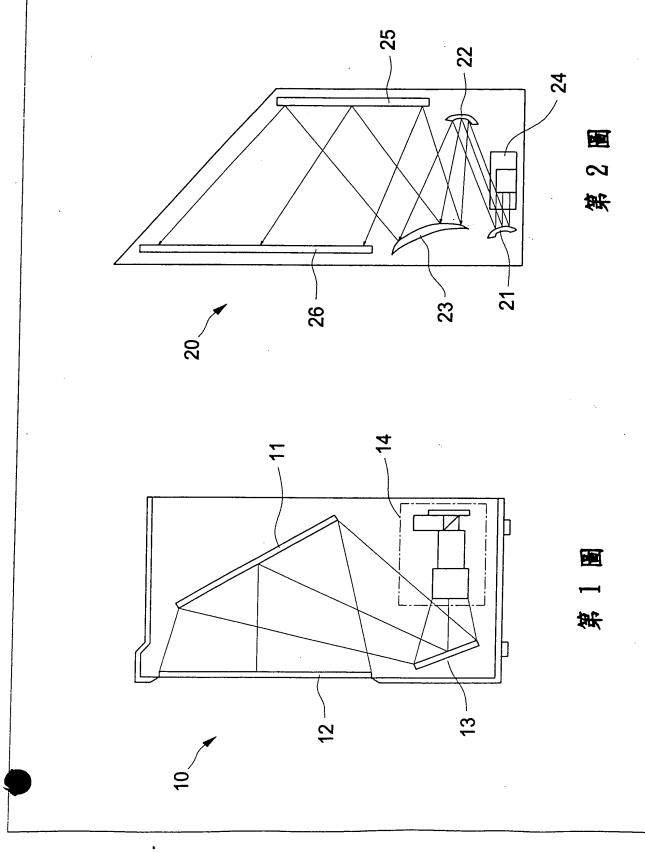
3 5



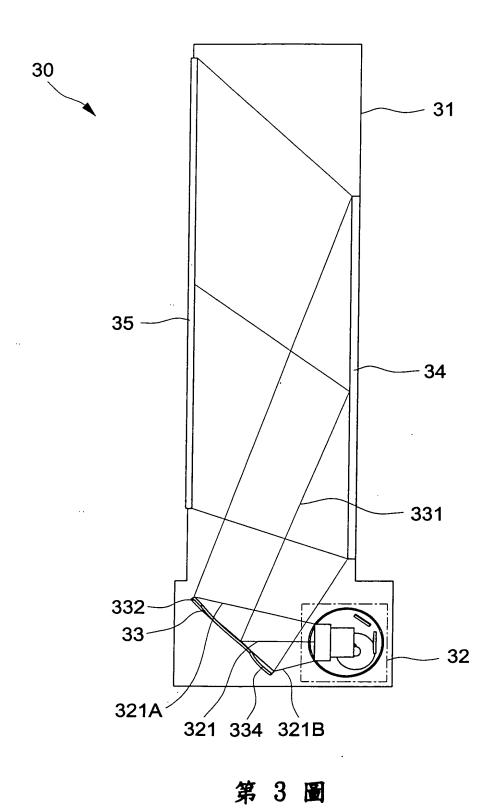
六、申請專利範圍

- 1、一種背投影顯示裝置,其具有一殼體,該殼體內包括:
 - 一光學引擎,係用以提供一影像光束;
 - 一多重曲率反射鏡,係設於該影像光束之光路徑上,且其由複數個不同曲率半徑之反射面所組成;以及
 - 一螢幕,係設於該多重曲率反射鏡反射影像光束之路徑上,以供顯示影像。
- 2、如申請專利範圍第1項所述之背投影顯示裝置,其中該反射面之曲率半徑係依該光路徑而設。
- 3、如申請專利範圍第1項所述之背投影顯示裝置,其中該螢幕背面設有一平面鏡,且該平面鏡位於該多重曲率反射鏡反射影像光束之路徑上。
- 4、如申請專利範圍第3項所述之背投影顯示裝置,其中該平面鏡係平行於該螢幕設置。

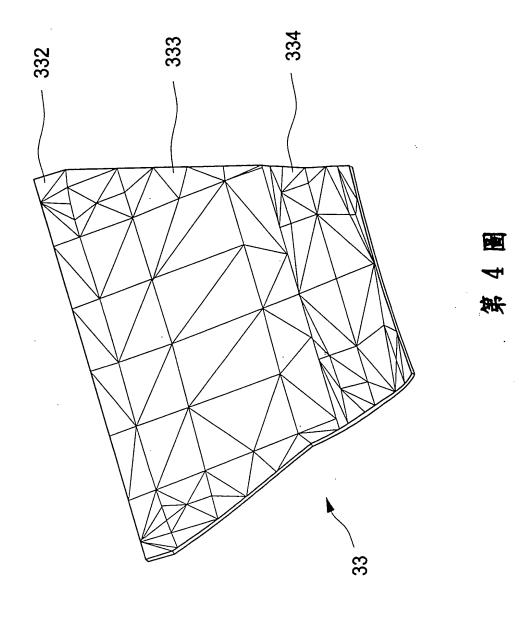


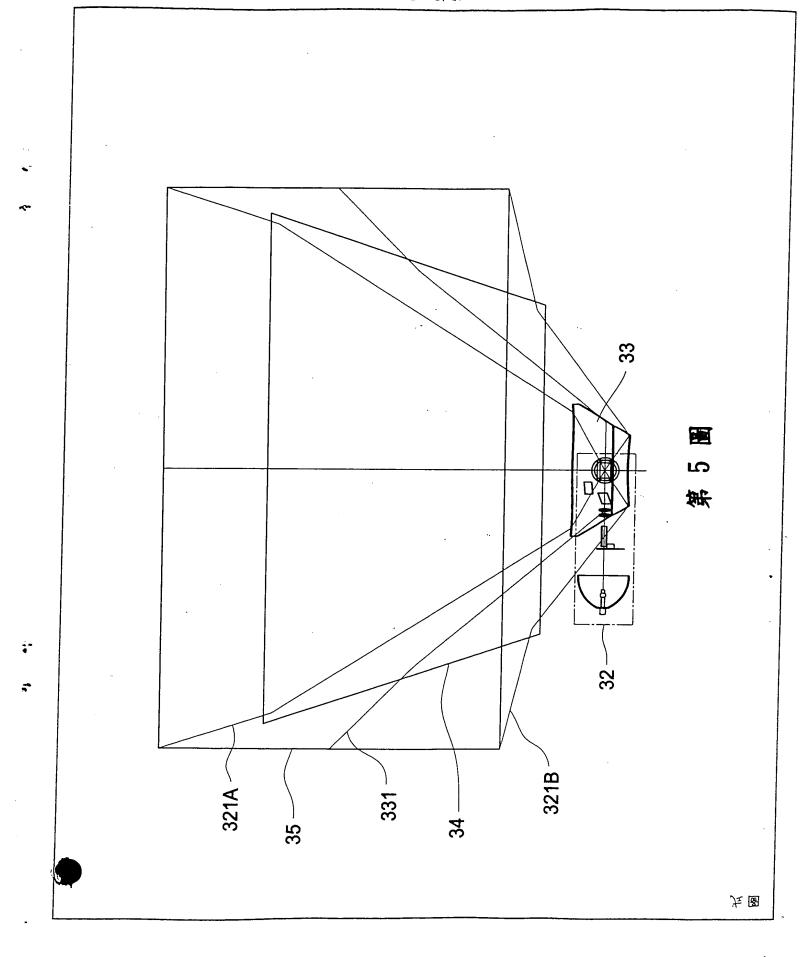


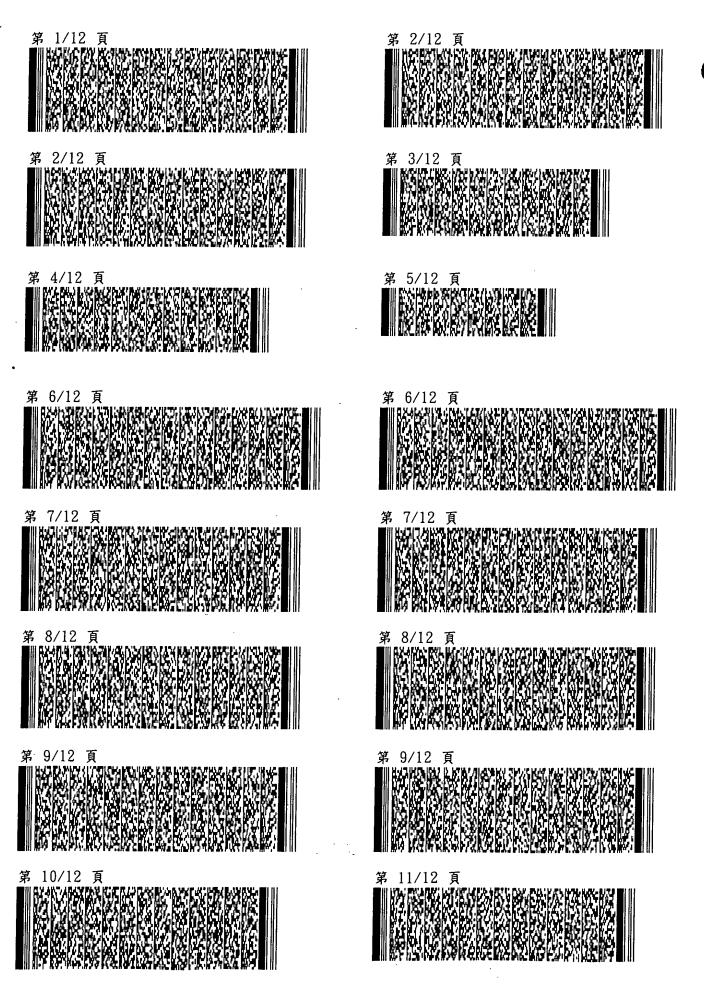
注 圈



第14頁







(4.5版)申請案件名稱:背投影顯示裝置

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